

CLAIMS

What is claimed is:

- 1 1. A method for allowing a device to be removably attached to a computer system while
2 maintaining the system integrity, comprising the steps of:
3 configuring a bridge between the device and the computer system; wherein
4 while in an attached state
5 if recognizing that the device has been removed from the
6 bridge, then the bridge transitioning into a cleanup
7 state, then a removed state;
8 while in the cleanup state, performing the ordered steps of
9 the bridge sending a first signal to the computer system;
10 in response to the first signal, the computer system sending a
11 second signal to the bridge; and
12 in response to the second signal, the bridge sending a third
13 signal to the computer system to indicate that the bridge
14 has been removed from the computer system;
15 removing the device from the bridge is performed without giving prior
16 notice to the bridge, nor the computer system;
17 the attached state indicating that the device has been attached to the
18 computer system; and
19 the removed state indicating that the device has been removed from the
20 computer system.

- 1 2. The method of Claim 1 wherein the bridge using a first protocol to communicate with
2 the computer system, and using a second protocol to communicate with the device.
- 1 3. The method of Claim 2 wherein the first protocol or the second protocol is:
2 a protocol complying with the SCSI standard;
3 a protocol complying with the IDE standard;
4 a protocol complying with the fibre channel standard;
5 a protocol complying with the IEEE 1394 standard; or
6 a protocol complying with the USB standard.
- 1 4. The method of Claim 2 wherein the bridge includes a processing unit and memory to
2 convert commands of the first protocol and the second protocol.
- 1 5. The method of Claim 2 wherein the first protocol is the same as the second protocol.
- 1 6. The method of Claim 1 wherein, while in the cleanup state, if the bridge receives a
2 processing command, then the bridge sends a fourth signal to the computer system
3 indicating that the bridge cannot process the command.
- 1 7. The method of Claim 6 wherein, while in the cleanup state, the bridge further sends a
2 fifth signal to the computer system indicating that the command has been terminated.

- 1 8. The method of Claim 7 wherein, while in the cleanup state, the computer system,
2 upon receiving the fourth or the fifth signal from the bridge, provides a sixth signal to
3 indicate that the command cannot be processed.
- 1 9. The method of Claim 1 further comprising the step of providing a buffer between the
2 device and the bridge for protecting the bridge from disruption signals from the
3 device.
- 1 10. The method of Claim 1 further comprising the step of providing a buffer between the
2 device and the bridge wherein the buffer prevents the signals passing from the device
3 to the bridge.
- 1 11. The method of Claim 10 wherein the bridge transitioning to the cleanup state upon
2 recognizing that the bridge cannot communicate with the device via the buffer.
- 1 12. The method of Claim 1 wherein:
2 the bridge recognizes that the device has been removed from the bridge based
3 on a signal asserted at a control pin of the bridge; and
4 the signal changes when the control pin of the bridge is engaged to or
5 disengaged from a control pin of the device.
- 1 13. A system for allowing a device to be removably attached to a computer system while
2 maintaining the system integrity, comprising:
3 a bridge interfacing between the device and the computer system;

4 wherein
5 while in an attached state
6 if recognizing that the device has been removed from the
7 bridge, then the bridge transitioning into a cleanup state,
8 then a removed state;
9 while in the cleanup state
10 the bridge sending a first signal to the computer system;
11 in response to the first signal, the computer system sending a
12 second signal to the bridge; and
13 in response to the second signal, the bridge sending a third
14 signal to the computer system to indicate that the bridge
15 has been removed from the computer system;
16 removing the device from the bridge is performed without giving prior
17 notice to the bridge, nor the computer system;
18 the attached state indicating that the device has been attached to the
19 computer system; and
20 the removed state indicating that the device has been removed from the
21 computer system.

1 14. The system of Claim 13 wherein the bridge using a first protocol to communicate with
2 the computer system, and using a second protocol to communicate with the device.

1 15. The system of Claim 14 wherein the first protocol or the second protocol is:
2 a protocol complying with the SCSI standard;

3 a protocol complying with the IDE standard;
4 a protocol complying with the fibre channel standard;
5 a protocol complying with the IEEE 1394 standard; or
6 a protocol complying with the USB standard.

1 16. The system of Claim 13 wherein the bridge includes a processing unit and memory to
2 convert commands of the first protocol and the second protocol.

1 17. The system of Claim 13 wherein the first protocol is the same as the second protocol.

1 18. The system of Claim 13 wherein, while in the cleanup state, if the bridge receives a
2 processing command, then the bridge sends a fourth signal to the computer system
3 indicating that the bridge cannot process the command.

1 19. The system of Claim 18 wherein, while in the cleanup state, the bridge further sends a
2 fifth signal to the computer system indicating that the command has been terminated.

1 20. The system of Claim 19 wherein, while in the cleanup state, the computer system,
2 upon receiving the fourth or the fifth signal from the bridge, provides a sixth signal to
3 indicate that the command cannot be processed.

1 21. The system of Claim 13 further comprising a buffer between the device and the bridge
2 for protecting the bridge from disruption signals from the device.

- 1 22. The system of Claim 13 further comprising a buffer between the device and the bridge
2 wherein the buffer prevents the signals passing from the device to the bridge.
- 1 23. The system of Claim 22 wherein the bridge transitions to the cleanup state upon
2 recognizing that the bridge cannot communicate with the device via the buffer.
- 1 24. The system of Claim 13 wherein:
2 the bridge recognizes that the device has been removed from the bridge based
3 on a signal asserted at a control pin of the bridge; and
4 the signal changes when the control pin of the bridge is engaged to or
5 disengaged from a control pin of the device.
- 1 25. A method for hot removing a device from a system, comprising the steps of:
2 configuring a bridge between the device and the system; and
3 configuring a buffer between the device and the bridge for protecting the
4 bridge from signals from the device; wherein
5 while in an attached state
6 if recognizing that the device has been removed from the
7 bridge, then the bridge transitioning into a cleanup
8 state, then a removed state;
9 while in the cleanup state,
10 the bridge sending a first signal to the system;
11 in response to the first signal, the system sending a second
12 signal to the bridge; and

13 in response to the second signal, the bridge sending a third
14 signal to the system to indicate that the bridge has been
15 removed from the system.